

## REMARKS

Claims 1-16 are now pending in the application. The Specification has been amended. Claims 1 and 7 are independent. Reconsideration of this application, as amended, is respectfully requested.

### Drawing Objections

The drawings stand objected to under 37 C.F.R. S 1.83(a) as not illustrating every feature of the invention specified in the claims. In particular, the Examiner asserts that the curvedly supported, flat piezo-film must be illustrated. Applicant respectfully submits that this aspect of the present invention is sufficiently illustrated in the current drawings.

At the outset, it is pointed out that the term "flat" has been deleted from the claims. This will be discussed further below with regard to the Examiner's rejection under 35 U.S.C. 112, second paragraph.

In addition, referring to Figures 1 and 2 of the present invention, the speaker 10 is illustrated as being flat. However, this is merely because these particular views cannot show the curvature of speaker 10. Figure 1 is a cross-section of the helmet 1, while Figure 2 is a side view of the helmet 1. However, Figure 4 illustrates the "supported shape of the piezo-film speaker" (see page 6, lines 19-23 of the present specification). In view of this, it should be readily understood that the supported speaker 10 will have a shape that corresponds to the curvature of the helmet on which the speaker is supported. However, as should be understood, this curvature is particularly selected to be within the range recited in the claims of the present invention.

In view of the above, Applicant submits that the current drawings are clear in that they illustrate a helmet that has a curved shape (Figures 1 and 2), as well as the supported shape of the speaker 10 (Figure 4). In view of this, it is believed that no amendments to the drawings are necessary. Reconsideration of the drawing objection is therefore respectfully requested.

### **Rejection Under 35 U.S.C. § 112**

Claims 7-14 and 16 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

At the outset, it is respectfully pointed out that the Examiner has only rejected claims 7-14 and 16 in the statement of rejection. However, claims 1-6 and 15 also include the recitation regarding a flat piezo-film having a radius of curvature. Clarification in the next Office Communication is respectfully requested.

With regard to the merits of the Examiner's rejection, Applicants point out that the claims have been amended to delete the term "flat" therefrom. The piezo-film is flat prior to being supported on the curved surface of the helmet. However, once supported, the piezo-film is curvedly supported as recited by the amended claims of the present invention. In addition, the curvature is such that the "radius of curvature (R) at each curved portion is in a range of  $R \geq 200$  mm." This being accomplished by particularly selecting the curvature of the helmet to be within the above range.

In view of the above amendments and remarks, Applicants respectfully submit that claims 7-14 and 16 are definite and clear. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, second paragraph, are respectfully requested.

**Rejection Under 35 U.S.C. § 103**

Claims 1-6 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Park et al., U.S. Patent No. 5,309,519. This rejection is respectfully traversed.

The present invention as recited in independent claim 1 is directed to a piezo-film speaker. Independent claim 1 of the present invention requires a combination of elements including “a piezo-film curvedly supported to form at least one curved portion ... having at least a radius (R) of curvature at each curved portion in a range of  $R \geq 200$  mm or an area (S) of a principal surface of said piezo-film is in a range of  $S \geq 40$  cm<sup>2</sup>.”

With the above construction according to the present invention, it is possible to reproduce sound at a sound pressure, which is sufficiently audible, even when riding a motorcycle. In addition, it is possible to provide voice/sound reproduction at a sound pressure having a high tone quality and adequate volume. Applicant respectfully submits that the references relied on by the Examiner are insufficient to teach or suggest the above aspects of the present invention and are therefore incapable of accomplishing the above advantages of the present invention.

The Examiner relies on the Park et al. reference in order to render the presently claimed invention obvious. Applicant respectfully submits that Park et al. is insufficient to suggest the presently claimed invention. Specifically, the Park et al. reference disclose a piezo-film having

some extent of curvature; however, the curvature is clearly not as substantial as the 200 mm curvature of the present invention.

However, as explained by the present inventor in the disclosure of the present invention, in a piezo-film, the quality of acoustic output is dependent on the radius of curvature of a curved portion of the piezo-film and the surface area of the curved portion. The possible combinations of radius of curvature and surface of a curved portion of a piezo-film is very large (almost infinite). In view of this, it is very difficult to determine the appropriate combination of radius of curvature and surface of a curved portion of a piezo-film to obtain the most advantageous results. It is the present inventors that have determined the most appropriate combination in order to obtain a high quality of acoustic output. Applicant respectfully submits that there is absolutely no teaching in the references relied on by the Examiner of the radius of curvature and surface of a curved portion of a piezo-film. In view of this, the Examiner's rejection is improper and should be withdrawn.

The Examiner recognizes that the Park et al. reference fails to teach the radius of curvature and surface of a curved portion of a piezo-film. However, the Examiner has taken the position that it would be obvious to modify the Park et al. reference to arrive at the presently claimed invention. Applicant respectfully submits that the Examiner has not established a *prima facie* case of obviousness. For example, with regard to claim 1, the Examiner states the following:

Since Park et al. do utilize the flat piezo-film in many applications and do not restrict to any specific configurations for the film, it therefore would have been obvious to one skilled in the art at the time the invention was made to

provide a flat piezo-film with desirable configurations, such as a slightly curved configuration (with a rather large radius and sufficient active surface area), for any suitable supporting structure, in order to generate desirable sound.

Applicant respectfully submits that the above is insufficient to establish a *prima facie* case of obviousness. As the Examiner will note, MPEP § 2142, third paragraph (August 2001) states the following:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations."

Applicants respectfully submit that the Examiner has failed to meet the necessary burden in establishing a *prima facie* case of obviousness, since the Examiner has not provided any suggestion or motivation to modify the combination of references relied on. The Examiner must first establish a *prima facie* case of obviousness before the burden shifts to the Applicants to rebut the *prima facie* case. The Examiner is shifting the burden to Applicants to prove non-obviousness without first establishing obviousness.

Referring to paragraph 4 of MPEP § 2142, the Examiner is placed with the initial burden "to provide some suggestion of the desirability of doing what the inventor has done." The Examiner must show that the references expressly or impliedly suggest the claimed invention or a convincing line of reasoning should be set forth as to why the modification is obvious. The

Examiner has provided no suggestion or convincing line of reasoning in the present case. Accordingly, the Examiner's burden has not been satisfied.

The only rationale provided by the Examiner is a statement that the modification would be obvious, since the references are not restricted to any specific configuration for the film. Applicant respectfully submits that this is not establishing a *prima facie* case of obviousness. In addition, the Examiner is attempting to avoid establishing a *prima facie* case of obviousness by shifting the burden to Applicant to prove non-obviousness without providing any teaching or suggestion to modify the references. As noted above, there must be some suggestion to modify a reference in order to establish a *prima facie* case of obviousness. The Examiner has set forth no suggestion for the modifications and therefore the rejection should be withdrawn. It is respectfully requested that the Examiner provide some suggestion for modifying the combination of references to select the specific radius of curvature or the specific surface of the curved portion of the piezo-film. Since the references are silent with regard to such a suggestion, it is requested that the Examiner withdraw the rejection.

Furthermore, it appears that the Examiner has taken the position that it would only require routine experimentation to arrive at the present invention. However, the Examiner has not demonstrated that the radius of curvature and surface of a curved portion of a piezo-film is a result-effective variable with regard to sound quality. A particular parameter must first be recognized as a result-effective variable, a variable that achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Since the

Examiner has not shown that the prior art recognizes the relationship between radius of curvature and surface of a curved portion of a piezo-film, Applicant submits that there is insufficient teaching to optimize the radius of curvature and surface. It is applicants that have demonstrated that the radius of curvature and the surface of a curved portion of a piezo-film increases acoustic performance, not the references relied on by the Examiner or other prior art.

Further to this, Applicant respectfully submits that the Examiner has not provided any indication that the prior art was aware that the radius of curvature or surface of a curved portion of a piezo-film has anything to do with sound quality. This awareness was determined by Applicant. Applicant submits that this treatment by the Examiner is improper. "If there is no evidence that a person of ordinary skill in the art at the time of applicants' invention would have expected problem to exist at all, it is not proper to conclude that invention which solves this problem, which is claimed as an improvement of prior art device, would have been obvious to that hypothetical person." *In re Nomiya*, 184 U.S.P.Q. 607, 608 (CCPA 1975)(emphasis added). In the present case, neither the Park et al. or Szilagyi et al. references recognize that the radius of curvature and surface of a curved portion of a piezo-film is important to sound quality. This awareness appears only in Applicant's own disclosure. "There must be a reason apparent at time invention was made to person of ordinary skill in the art for applying the teaching at hand, or use of teaching as evidence of obviousness will entail prohibited hindsight." *Id.* at 608. This is exactly what the Examiner is doing in the present case. The Examiner has not provided any evidence of the awareness of a problem in the prior art and therefore one having ordinary skill in

the art would not recognize to look for a solution. Accordingly, the Examiner is conducting prohibited hindsight.

It should also be pointed out that "a patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. § 103" *In re Sponnoble*, 405 F.2d 578, 585, 160 U.S.P.Q. 237, 243 (CCPA 1969). Accordingly, the Examiner must provide evidence that one having ordinary skill in the art was aware of a problem before the Examiner can modify a prior art reference to arrive at the present invention. Since the Examiner has not provided evidence of an art recognized problem, the Examiner's rejection is improper and should be withdrawn.

Referring to page 4, last paragraph of the Examiner's Office Action, the following is stated:

Furthermore, with regard to claims 1-4, it is well known in the art, that changing the radius of a curved surface of a piezoelectric-film transducer would directly effect the characteristics of the transducer, since the pattern of X, Y, Z-directional bending waves applied to the film has been rearranged. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide a flat piezo-film with a properly curved configuration and a properly sized active surface area, such as a radius of 30 cm and an area of 50 cm\*cm, for a suitable supporting structure with a 30 cm radius curved surface, for generating sound with desirable acoustic characteristics and sufficient acoustic output.

Applicant respectfully requests the Examiner to provide evidence of the above assertion.

Applicant is unaware of any such teaching. As described at page 1, line 19 through page 2, line



12 of the present specification, the JP 7-327298 reference discloses the radius of curvature affecting the output efficiency of a piezo-film speaker. However, this reference is merely a general technique for increasing output. There is no recognition in this reference of controlling the quality of the acoustic output by changing the radius of curvature and the surface area of the curved portion as in the present invention.

The Examiner is directed to MPEP § 2144.03 entitled "Reliance on Common Knowledge in the Art or 'Well Known' Prior Art." In particular, the section of the MPEP states "[i]n very limited circumstances, it is appropriate for an examiner to take official notice of facts not in the record or to rely on 'common knowledge' in making a rejection, however, such rejections should be judiciously applied." This section of the MPEP also provides support for requesting the Examiner to provide evidence of the "well known" prior art.

As the Examiner will note, the above section of the MPEP also indicates that it would not be appropriate to rely on "well known" prior art, if the Examiner does not provide sufficient evidentiary support for the "well known" prior art if the Examiner believes that the claims are properly finally rejected in the next Office Action. Accordingly, if the Examiner does not believe that the application is in condition for allowance, and the Examiner believes the claims should be finally rejected, it is requested that the Examiner provide Applicant with sufficient evidentiary support for the above "well known" prior art.

With regard to dependent claims 2-6 and 15, Applicant respectfully submits that these claims are allowable due to their dependence on allowable independent claim 1, as well as due to the additional limitations recited by these claims.

In view of the above amendments and remarks, Applicant respectfully submits that claims 1-6 and 15 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. § 103 are respectfully requested.

#### **Allowable Subject Matter**

The Examiner has not rejection claims 7-14 and 16 in view of the prior art. These claims have only been rejected under 35 U.S.C. 112, second paragraph. Since the Examiner's rejection under 35 U.S.C. 112, second paragraph has been overcome for the above reasons, Applicant believes that claims 7-14 and 16 are in condition for allowance.

With regard to claims 1-6 and 15, these claims have only been rejected in view of the prior art. Since the Examiner's rejection under 35 U.S.C. § 103 has been overcome in view of the above comments, Applicant also believes that claims 1-6 and 15 are in condition for allowance.

Favorable consideration and early allowance of the present application are respectfully requested.

#### **CONCLUSION**

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently pending rejections and that they be withdrawn.

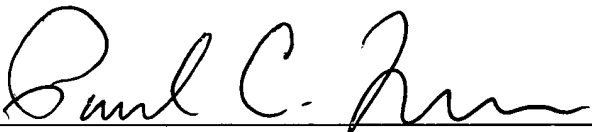
It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis (Reg. No. 43, 368) at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Very truly yours,

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